

WHAT IS CLAIMED IS:

1. An amplification optical fiber for amplifying signals under supply of pumping light, said amplification optical fiber comprising:

5 a core region doped with a rare earth element;
a zero-dispersion wavelength of 1.5 μm or less;

and

an effective cutoff wavelength of 1.1 μm or more but 1.5 μm or less.

10 2. An amplification optical fiber according to claim 1, wherein said rare earth element includes erbium.

15 3. An amplification optical fiber according to claim 2, wherein a concentration of erbium in said core region is 3000 wt.ppm or less and an absorption loss at a wavelength of 1.53 μm is 10 dB/m or more.

4. An amplification optical fiber according to claim 1, further having a mode field diameter of 4.0 μm or more but 9.0 μm or less at a wavelength of 1.55 μm .

20 5. An amplification optical fiber according to claim 4, further having the mode field diameter of 4.0 μm or more but 7.5 μm or less at the wavelength of 1.55 μm .

25 6. A fiber optic amplifier comprising:
a pumping light source for emitting pumping light of a predetermined wavelength; and

an amplification optical fiber for amplifying signals under supply of said pumping light, said amplification optical fiber comprising:

a core region doped with a rare earth element;

5 a zero-dispersion wavelength of not more than the wavelength of said pumping light; and

an effective cutoff wavelength of 1.1 μm or more but not more than the wavelength of said pumping light.

7. A fiber optic amplifier according to claim 8, wherein the rare earth element in the core region of said amplification optical fiber includes erbium.

8. A fiber optic amplifier according to claim 7, wherein a concentration of erbium in the core region of said amplification optical fiber is 3000 wt.ppm or less and an absorption loss at a wavelength of 1.53 μm is 10 dB/m or more.

9. A fiber optic amplifier according to claim 6, wherein said amplification optical fiber further has a mode field diameter of 4.0 μm or more but 9.0 μm or less at a wavelength of 1.55 μm .

10. A fiber optic amplifier according to claim 9, wherein said amplification optical fiber further has the mode field diameter of 4.0 μm or more but 7.5 μm or less at the wavelength of 1.55 μm .

11. A fiber optic amplifier comprising:

a plurality of amplification optical fibers

connected in multiple stages, each amplifying signals under supply of pumping light;

a pumping light supply system for supplying said pumping light to each of said plurality of amplification optical fibers;

wherein at least an amplification optical fiber located in the final stage in a traveling direction of said signals, out of said plurality of amplification optical fibers, comprises:

a core region doped with a rare earth element;
a zero-dispersion wavelength of not more than a wavelength of said pumping light; and
an effective cutoff wavelength of 1.1 μm or more but not more than the wavelength of said pumping light.

12. A fiber optic amplifier according to claim 11, wherein said pumping light supply system comprises one or more pumping light sources.

13. A fiber optic amplifier according to Claim 11, wherein the rare earth element in the core region of said amplification optical fiber includes erbium.

14. A fiber optic amplifier according to claim 13, wherein a concentration of erbium in the core region of said amplification optical fiber is 3000 wt.ppm or less and an absorption loss at a wavelength of 1.53 μm is 10 dB/m or more.

15. A fiber optic amplifier according to claim

11, wherein said amplification optical fiber further has a mode field diameter of 4.0 μm or more but 9.0 μm or less at a wavelength of 1.55 μm .

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16. A fiber optic amplifier according to claim 15, wherein said amplification optical fiber further has the mode field diameter of 4.0 μm or more but 7.5 μm or less at the wavelength of 1.55 μm .